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Pesticide Fact Sheet Number 211: Oryzalin

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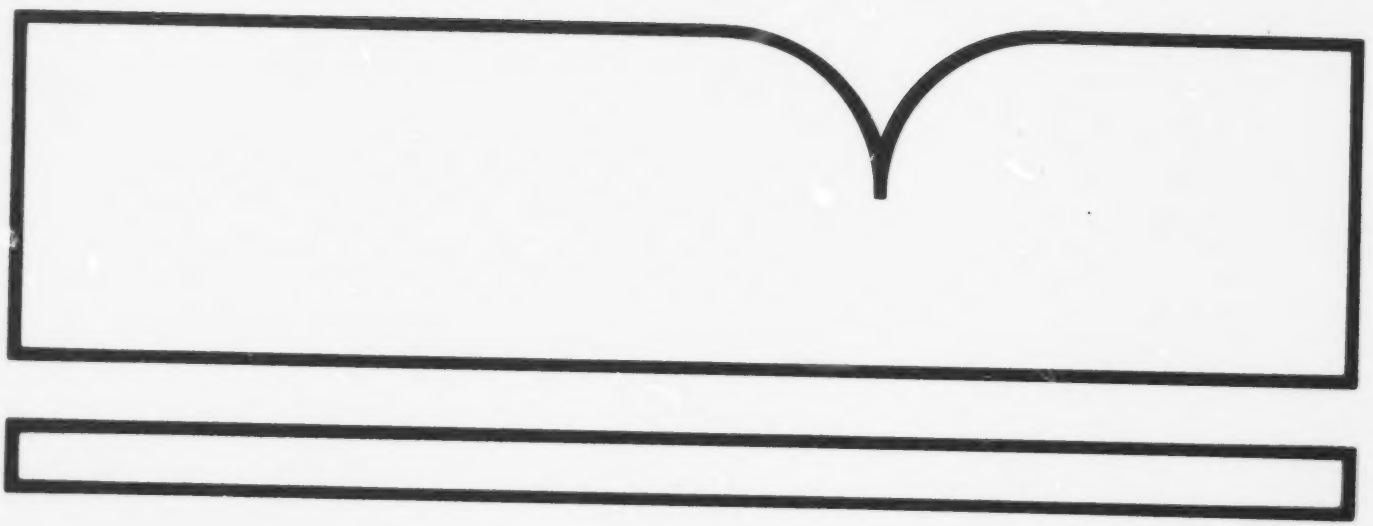

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13. Type of Report & Period Covered

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reinssuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, science findings.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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EPA Pesticide Fact Sheet

Name of Chemical: Oryzalin
Reason for Issuance: Registration Standard
Date Issued: 30 JUN 1987
Fact Sheet Number: 211

1. DESCRIPTION OF CHEMICAL

Generic Name:	Oryzalin
Common Name:	Oryzalin (WSSA, BSI, ISO, ANSI); EL-119 (Code Number)
Trade Names:	Surflan®, Ryzelan™
EPA Shaughnessy Code:	104201
Chemical Abstracts Service (CAS) Number:	19044-88-3
Year of Initial Registration:	1974
Pesticide Type:	Herbicide
Chemical Family:	Dinitroaniline
U.S. And Foreign Producers:	Eli Lilly Company

2. USE PATTERNS AND FORMULATIONS

Application Sites: To control annual grasses and broadleaf weeds in fruit, nut crops, vineyards (bearing and nonbearing), soybeans, cotton (Texas only), Peas (English and green), tobacco (air- and flue-cured), potatoes (white), small grains (wheat and barley), forestry and Christmas tree plantations, established ornamentals, and noncropland areas.

Mechanism of Action: When applied to soil and with adequate rainfall or irrigation, oryzalin affects physiological growth processes associated with seed germination.

Types of Formulations: Emulsifiable concentrate, flowable liquid concentrate, and wettable powder.

Types and Methods of Application: Aerial and ground sprays, application through irrigation systems.

Application Rates: Vary from 0.28 to 6.0 lbs of active ingredient per acre depending upon the use site, weeds to be controlled and soil conditions.

3. SCIENCE FINDINGS

Summary Science Statement: Oryzalin has been found to be oncogenic in rats and has been classified as a Group C carcinogen. Oryzalin is not acutely toxic in general.

Chemical Characteristics:

Physical State:	Crystalline
Color:	Yellow-orange
Odor:	None
Vapor pressure:	< 1 X 10-7 mm Hg at 30°C
Melting Point:	141°C to 142°C
Flammability:	Technical material is a flammable solid. No special precautions for end-use products.

Solubility 25°C:

Solvent	g/100 ml
Water	.00025 (2.5 ppm)
Acetone	>50
Acetonitrile	>15
Benzene	0.4
Dicloromethane	73
Methanol	5
Methyl cellosolve	50
Xylene	0.2
Ethanol	readily soluble
Hexane	insoluble

Toxicological Characteristics:

Acute Effects:	
Acute Oral Toxicity:	>10 g/kg (Rat, in 5% acacia) >5 g/kg (Rat, in DMSO) >1 g/kg (Dog) (Toxicity Category III)
Acute Dermal Toxicity:	>2 g/kg (rabbit) (Toxicity Category III)
Acute Inhalation Toxicity (75WP):	>3.56 mg/l (Toxicity Category III)
Primary Eye Irritation:	Slight corneal damage (Toxicity Category III)
Major Routes of Exposure:	Dermal, inhalation.
Chronic Effects:	
F-344 rat - one year:	Minimal toxicity was observed at the medium and highest dose levels of 900 ppm and 2700 ppm in the feed.
86C3F1 mouse - one year:	NOEL determined to be 500 ppm in the diet.
Oncogenicity:	
F-344 rat - two year:	Increases in thyroid gland tumors, three different groups of skin tumors, and mammary gland tumors were observed. Oryzalin is considered to be oncogenic to rats based on this study.
B6C3F1 mouse - two year:	Negative for oncogenicity with slight weight decrease and detectable organ effects.
Reproduction:	NOEL of 250 ppm.
Teratology:	
Rat:	No teratogenic effects observed at 2250 ppm (225 mg/kg) in the diet; the NOEL for teratogenicity following oral intubation is at least 225 mg/kg/day.
Dutch Belted Rabbits:	NOEL of at least 125 mg/kg/day.

Mutagenicity: histidine auxotrophs of Salmonella typhimurium indicate no mutagenic effect from 0.1 to 1,000 ug/ml.

Chromosomal Aberrations: Oryzalin did not result in an increase in dominant lethal mutations in the Wistar rat.

Primary DNA Damage: Oryzalin administered intraperitoneally induced sister chromatid exchanges (SCEs), however, oryzalin administered orally did not induce SCEs in the bone marrow of Chinese hamsters.

Physiological and Biochemical Behavioral Characteristics:

Metabolism: Harlan male rats - 40% excreted in urine and 40% in feces in 3 days. Other studies with rabbits, a 400-pound steer and Rhesus monkeys demonstrated similar high rates of elimination of oryzalin.

Environmental Characteristics:

Preliminary adsorption and leaching characteristics: Oryzalin is leached to a limited extent under natural rainfall conditions depending upon soil organic matter and clay content. These characteristics are not adequately understood.

Resultant average persistence: Preliminary field studies with 14C oryzalin have indicated a relatively short anaerobic half-life.

Ecological Characteristics: Data are sufficient to characterize oryzalin as practically nontoxic to birds, and laboratory and field studies indicate no undue hazard to fish.

Tolerance Assessment:

List of crops and tolerances: (CFR 40 180.304)

Commodity	Tolerance (ppm)
Almond, hulls	0.05
Avocados	0.05
Citrus fruits	0.05
Cottonseed	0.05
Figs	0.05
Kiwifruits	0.05
Nuts	0.05
Olives	0.05

Commodity	Tolerance (ppm)
Peas (succulent)	0.05
Peppermint hay	0.05
Pistachios	0.05
Pome fruit	0.05
Pomegranates	0.05
Potatoes	0.05
Small fruits	0.05
Soybeans	0.1
Spearmint hay	0.05
Stone fruits	0.05
Sweet potatoes	0.05

Results of Tolerance Assessment: PADI in humans is 0.013 mg/kg/day, with NOEL of 12.50 mg/kg/day and a safety factor of 1,000. These figures may be refined by the two-year dog study required by the Registration Standard.

4. SUMMARY OF REGULATORY POSITION AND RATIONALE

Use, Formulation or Geographic Restrictions: Manufacturing-use products may only be formulated into end-use products intended for use as an herbicide on fruit, nut crops, vineyards (bearing and nonbearing), soybeans, cotton (Texas only), peas (English or green), tobacco (air- and flue-cured), potato (white), small grains (wheat and barley), forestry and Christmas tree plantations, established ornamentals, and noncropland areas.

Unique label warning statements:

All Manufacturing-use Products

"Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in a NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA."

End-use Products

"Do not graze or feed forage from treated fields or orchards to livestock."

"Mixer/loader/applicators must wear protective clothing, consisting of coveralls, a long-sleeved shirt, shoes and impermeable gloves when handling this product."

Non-granular End-use Products

"Do not apply directly to water or wetlands. Do not contaminate water by cleaning of equipment or disposal of wastes."

End-use Products Applied by Center Pivot Irrigation Systems: The labels of these products must bear a posting requirements statement and the appropriate chemigation instructions, as specified in the Registration Standard.

5. SUMMARY OF MAJOR DATA GAPS

Data required	Due Date (after issuance of the Standard)
Product Chemistry	6 - 12 months
Nature of residues (Metabolism)	18 months
Chronic toxicity (dog)	11/15/86*
Hydrolysis	9 months
Photodegradation	9 months
Soil metabolism studies	27 months
Leaching and adsorption/ desorption	12 months
Volatility (lab)	12 months
Dissipation studies - field	27 months
Rotational crops - confined	39 months
Fish accumulation	12 months
Accumulation in aquatic non-target organisms	12 months

* Study received 12/86.

6. CONTACT PERSON AT EPA

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DISCLAIMER: The information presented in this Pesticide Fact Sheet is for informational purposes only and may not be used to fulfill data requirements for pesticide registration and reregistration.